

CLAIMS

1. A radio communication management method in a  
radio communication system which manages link connection of  
5 a mobile terminal using HMIPv6,

wherein the mobile terminal transmits information  
on authentication for accessing a desired network together  
with information for changing the link connection with  
respect to a server which manages the link connection of  
10 the mobile terminal to reduce a time required for changing  
the link connection of the mobile terminal.

2. The radio communication management method  
according to claim 1, wherein the mobile terminal transmits  
15 the information for changing the link connection and the  
information on the authentication as one piece of  
information, and the server which manages the link  
connection acquires each of the information for changing  
the link connection and the information on the  
20 authentication from the one piece of information.

3. The radio communication management method  
according to claim 1, wherein the server which manages the  
link connection acquires an authentication result by an  
25 authentication process using the information on the

authentication.

4. The radio communication management method  
according to claim 3, wherein the server which manages the  
5 link connection communicates with an authentication server  
which authenticates the mobile terminal to acquire the  
authentication result.

5. The radio communication management method  
10 according to claim 3, comprising the steps of: transmitting  
information notifying that the change of the link  
connection of the mobile terminal has been confirmed and  
the authentication result as one piece of information to  
the mobile terminal.

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6. The radio communication management method  
according to claim 3, wherein the server which manages the  
link connection transmits information notifying that the  
change of the link connection of the mobile terminal has  
20 been confirmed to the mobile terminal, and thereafter  
transmits the authentication result to the mobile terminal  
in a case where the authentication result is capable of  
being acquired.

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7. The radio communication management method

according to claim 6, wherein the server which manages the link connection sets a time until acquiring the authentication result, and transmits the authentication result to the mobile terminal together with information notifying that the change of the link connection of the mobile terminal has been confirmed, when next receiving the information for changing the link connection from the mobile terminal in a case where the authentication result is capable of being acquired within the time until acquiring the authentication result.

8. The radio communication management method according to claim 7, wherein the server which manages the link connection sets a predetermined tentative permission time for which the mobile terminal tentatively permits an access to the desired network, and transmits, to the mobile terminal, information notifying the permission of the access to the desired network only for the predetermined time together with the information notifying that the change of the link connection of the mobile terminal has been confirmed.

9. The radio communication management method according to claim 8, wherein the server which manages the link connection sets a predetermined permission time which

is longer than the predetermined tentative permission time and for which the mobile terminal permits the access to the desired network, and transmits, to the mobile terminal, the information notifying the permission of the access to the desired network only for the predetermined permission time together with the information notifying that the change of the link connection of the mobile terminal has been confirmed in a case where the authentication result indicates authentication success.

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10. The radio communication management method according to claim 8, wherein the server which manages the link connection performs registration relating to the change of the link connection of the mobile terminal which has permitted the access to the desired network for the predetermined tentative permission time or only for the predetermined permission time, and deletes the registration relating to the change of the link connection of the mobile terminal in a case where the predetermined tentative permission time or the predetermined permission time has elapsed.

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11. The radio communication management method according to claim 3, wherein the server which manages the link connection sets a time until acquiring the

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authentication result, and judges the authentication result as authentication failure in a case where the authentication result is not capable of being acquired within the time until acquiring the authentication result.

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12. The radio communication management method according to claim 5 or 6, wherein the server which manages the link connection sets a predetermined connection prohibition time with respect to the mobile terminal, and  
10 does not perform a process relating to the change of the link connection of the mobile terminal which has failed in the authentication and a process relating to the authentication for the predetermined connection prohibition time after notification of authentication failure in a case  
15 where the authentication failure is notified as the authentication result with respect to the mobile terminal.

13. The radio communication management method according to claim 5 or 6, wherein the server which manages  
20 the link connection performs registration relating to the change of the link connection of the mobile terminal which has succeeded in the authentication only in a case where authentication success is notified as the authentication result with respect to the mobile terminal.

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14. A radio communication management method in a radio communication system which manages link connection of a mobile terminal,

wherein the mobile terminal transmits information  
5 on authentication for accessing a desired network together with information for changing the link connection with respect to a server which manages the link connection of the mobile terminal, and

the server which manages the link connection sets  
10 a time until acquiring an authentication result by an authentication process using the information on the authentication, and transmits the authentication result to the mobile terminal in a case where the authentication result is capable of being acquired within the time until  
15 acquiring the authentication result.

15. The radio communication management method according to claim 14, wherein the server which manages the link connection sets a predetermined tentative permission  
20 time for which the mobile terminal tentatively permits an access to the desired network, and transmits, to the mobile terminal, information notifying the permission of the access to the desired network only for the predetermined time.

16. The radio communication management method according to claim 15, wherein the server which manages the link connection sets a predetermined permission time which is longer than the predetermined tentative permission time and for which the mobile terminal permits the access to the desired network, and transmits, to the mobile terminal, the information notifying the permission of the access to the desired network only for the predetermined permission time in a case where the authentication result indicates authentication success.

17. The radio communication management method according to claim 15 or 16, wherein the server which manages the link connection cuts the connection of the mobile terminal in a case where the predetermined tentative permission time or the predetermined permission time has elapsed.

18. A radio communication management method in a radio communication system which manages link connection of a mobile terminal,

wherein the mobile terminal transmits information on authentication for accessing a desired network together with information for changing the link connection with respect to a server which manages the link connection of

the mobile terminal, and

the server which manages the link connection sets a time until acquiring an authentication result by an authentication process using the information on the authentication, and judges the authentication result as authentication failure in a case where the authentication result is not capable of being acquired within the time until acquiring the authentication result.

10           19. The radio communication management method according to claim 14 or 18, wherein the server which manages the link connection sets a predetermined connection prohibition time with respect to the mobile terminal, and does not perform a process relating to the mobile terminal which has failed in the authentication only for the predetermined connection prohibition time after notification of the authentication failure in a case where the authentication failure is notified as the authentication result with respect to the mobile terminal.

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20. The radio communication management method according to claim 14, wherein the server which manages the link connection performs registration relating to the change of the link connection of the mobile terminal which has succeeded in the authentication only in a case where

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authentication success is notified as the authentication result with respect to the mobile terminal.

21. A radio communication management server which  
5 manages link connection of a mobile terminal using HMIPv6,  
constituted to receive, from the mobile terminal,  
information for changing the link connection and  
information on authentication for accessing a desired  
network as one piece of information, and acquire each of  
10 the information for changing the link connection and the  
information on the authentication from the one piece of  
information.

22. The radio communication management server  
15 according to claim 21, constituted to acquire an  
authentication result by an authentication process using  
the information on the authentication.

23. The radio communication management server  
20 according to claim 22, comprising:

means for communicating with an authentication  
server which authenticates the mobile terminal in such a  
manner as to acquire the authentication result.

25 24. The radio communication management server

according to claim 22, constituted to transmit, to the  
mobile terminal, information notifying that the change of  
the link connection of the mobile terminal has been  
confirmed and the authentication result as one piece of  
5 information.

25. The radio communication management server  
according to claim 22, constituted to transmit information  
notifying that the change of the link connection of the  
10 mobile terminal has been confirmed to the mobile terminal,  
and thereafter transmit the authentication result to the  
mobile terminal in a case where the authentication result  
is capable of being acquired.

15 26. The radio communication management server  
according to claim 25, further comprising: time setting  
means for setting a time until acquiring the authentication  
result in such a manner as to transmit the authentication  
result to the mobile terminal together with information  
20 notifying that the change of the link connection of the  
mobile terminal has been confirmed, when next receiving the  
information for changing the link connection from the  
mobile terminal in a case where the authentication result  
is capable of being acquired within the time until  
25 acquiring the authentication result.

27. The radio communication management server according to claim 26, further comprising:

time setting means for setting a predetermined  
5 tentative permission time to tentatively permit an access  
to the desired network with respect to the mobile terminal  
in such a manner as to transmit, to the mobile terminal,  
information notifying the permission of the access to the  
desired network only for the predetermined time together  
10 with information notifying that the change of the link  
connection of the mobile terminal has been confirmed.

28. The radio communication management server according to claim 27, further comprising:

15 time setting means for setting, with respect to  
the mobile terminal, a predetermined permission time which  
is longer than the predetermined tentative permission time  
and for which the mobile terminal permits the access to the  
desired network in such a manner as to transmit, to the  
20 mobile terminal, the information notifying the permission  
of the access to the desired network only for the  
predetermined time together with the information notifying  
that the change of the link connection of the mobile  
terminal has been confirmed in a case where the  
25 authentication result indicates authentication success.

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29. The radio communication management server according to claim 27, further comprising:

information registration means for performing  
5 registration relating to the change of the link connection of the mobile terminal which has permitted the access to the desired network for the predetermined tentative permission time or only for the predetermined permission time; and

10 information deletion means for deleting the registration relating to the change of the link connection of the mobile terminal in a case where the predetermined tentative permission time or the predetermined permission time has elapsed.

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30. The radio communication management server according to claim 22, further comprising:

time setting means for setting a time until acquiring the authentication result; and

20 judgment means for judging the authentication result as authentication failure in a case where the authentication result is not capable of being acquired within the time until acquiring the authentication result.

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31. The radio communication management server

according to claim 24 or 25, further comprising:

time setting means for setting a predetermined connection prohibition time with respect to the mobile terminal; and

5 control means for executing a control to prevent a process relating to the change of the link connection of the mobile terminal which has failed in the authentication and a process relating to the authentication from being performed for the predetermined connection prohibition time  
10 after notification of authentication failure in a case where the authentication failure is notified as the authentication result with respect to the mobile terminal.

32. The radio communication management server  
15 according to claim 24 or 25, further comprising:

control means for executing a control to perform registration relating to the change of the link connection of the mobile terminal which has succeeded in the authentication only in a case where authentication success  
20 is notified as the authentication result with respect to the mobile terminal.

33. A radio communication management server which manages link connection of a mobile terminal, comprising:

25 receiving means for receiving, from the mobile

terminal, information on authentication for accessing a desired network together with information for changing the link connection;

time setting means for setting a time until  
5 acquiring an authentication result by an authentication process using the information on the authentication; and  
transmitting means for transmitting the authentication result to the mobile terminal in a case where the authentication result is capable of being  
10 acquired within the time until acquiring the authentication result.

34. The radio communication management server according to claim 33, further comprising:

15 time setting means for setting a predetermined tentative permission time for which the mobile terminal tentatively permits an access to the desired network in such a manner as to transmit, to the mobile terminal, information notifying the permission of the access to the  
20 desired network only for the predetermined time.

35. The radio communication management server according to claim 34, further comprising:

time setting means for setting a predetermined  
25 permission time which is longer than the predetermined

tentative permission time and for which the mobile terminal permits the access to the desired network in such a manner as to transmit, to the mobile terminal, the information notifying the permission of the access to the desired  
5 network only for the predetermined time in a case where the authentication result indicates authentication success.

36. The radio communication management server according to claim 34 or 35, further comprising: control  
10 means for cutting the connection of the mobile terminal in a case where the predetermined tentative permission time or the predetermined permission time has elapsed.

37. A radio communication management server in a  
15 radio communication system which manages link connection of a mobile terminal, comprising:

receiving means for receiving, from the mobile terminal, information on authentication for accessing a desired network together with information for changing the  
20 link connection;

time setting means for setting a time until acquiring an authentication result by an authentication process using the information on the authentication by the server which manages the link connection; and

25 transmitting means for judging the authentication

result as authentication failure, and transmitting the authentication result to the mobile terminal in a case where the authentication result is not capable of being acquired within the time until acquiring the authentication  
5 result.

38. The radio communication management server according to claim 33 or 37, further comprising:

time setting means for setting a predetermined  
10 connection prohibition time with respect to the mobile terminal; and

control means for executing a control to prevent a process relating to the mobile terminal which has failed in the authentication from being performed only for the  
15 predetermined connection prohibition time after notification of authentication failure in a case where the authentication failure is notified as the authentication result with respect to the mobile terminal.

20 39. The radio communication management server according to claim 33, further comprising:

control means for executing a control to perform registration relating to the change of the link connection of the mobile terminal which has succeeded in the  
25 authentication only in a case where authentication success



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is notified as the authentication result with respect to the mobile terminal.